

**Title: Masted Vehicle****Field of the Invention**

The invention relates to a masted vehicle, such as an amphibious vehicle. The vehicle is useful in mass transport of passengers, such as tourists.

**5 Background of the invention**

Many types of terrestrial and amphibious vehicles are known in the art. See, for example, US patent no. 6,482,052. Mass transit amphibious vehicles are often used to transport commercial passengers, such as tourists. A preferred use is to provide guided tours involving transport on both land and water. Such vehicles are often  
10 painted on their sides, for example, with ducks or hippos. The two dimensional drawings on the side of the boat provide visual appeal.

It is well known that historical boats, such as masted ships, appeal to tourists, particularly in their three dimensional shape. However, to date, no masted amphibious vehicles have been used for transporting tourists. Masted ships are  
15 generally considered unsuitable for mass transit amphibious vehicles for tourists because of low hanging street barriers, such as telephone wires and power wires which run across streets, and which may hang as low as 30, 40 or 50 feet. Bridges and other obstacles may be as low as 15, 20 or 30 feet. The typical height of an amphibious vehicle for tourists is typically at least about 10 feet from the ground to  
20 the top edge of the hull.

Currently known masted amphibious and terrestrial vehicles do not have a historical design and are not suitable for mass transit of tourists, such as US 4,657,514, which is pedal powered.

There remains a need for a masted vehicles suitable for tourists.

**25 Summary of the Invention**

Certain aspects of embodiments of invention are summarized below, without limiting the scope of the invention. The invention relates to a vehicle, such as a terrestrial or amphibious mass transit passenger vehicle having masts and sides that appear

similar to a tall ship sailing vessel or a galleon. Although the embodiments of the invention are primarily described below with respect to an amphibious mass transit passenger vehicle, it would be understood by one of skill in the art that the invention may be adapted for use with a terrestrial (land-only) vehicle and that terrestrial  
5 vehicles are also included within the scope of the invention. In alternate embodiments, the vehicle is not necessarily used for mass transit of passengers (seating deck and seats are optional), but the vehicle is useful for displaying advertising on its sails when the sails are up and visible on the mast to passers-by. The vessel is also useful for educational purposes, for example, to provide a replica  
10 of a ship for describing its historical features to the students to be educated and, for example, reenacting historical events involving ships. Since the vehicle can operate on land, the students are able to view the vehicle without having to go to a water body.

In one embodiment, the invention comprises an amphibious land and water or a  
15 terrestrial vehicle comprising, a vehicle body, wherein for an amphibious vehicle, the body is sealed to be water-tight and provide buoyancy to the vehicle; a seating deck for seating of passengers (the deck optionally including seats for at least: 6, 10 20, 30 or 50 passengers); at least one retractable mast. The mast is optionally a folding or telescoping mast operable between a first position in which the retractable  
20 member is folded and a second position when the retractable member is extended. Typically, the mast protrudes from the body for travel on water and is retracted for travel on land. The mast optionally protrudes laterally or upwardly.

In one embodiment, the invention comprises an amphibious land and water vehicle comprising,  
25 vehicle sides;, a seating deck where passengers are seated (preferably having capacity for at least 20, 30, 40, 50 or 60 or more passengers); and a mast connected to the deck (the mast extendable and retractable as described herein).

In the first position, the mast assembly optionally comprises a base portion, a telescoping mast, a boom portion generally perpendicular to the mast. Optionally,  
30 three or more masts are connected to the deck. The vehicle comprises four wheels optionally comprising flaps over wheels (retractable or permanent flaps)

In one embodiment, the invention comprises an amphibious land and water vehicle comprising,

vehicle sides,

a seating deck where passengers are seated (preferably having capacity for at least

5 20, 30, 40 or 50 passengers), and

at least one retractable member, such as a mast connected to the deck.

Preferably, three or more masts are connected to the deck. Optionally an additional mast protrudes from the front of the ship. The vehicle preferably also includes a sail and a boom. The mast may be fixed but preferably the mast is retractable, capable  
10 of being raised or lowered in less than 10 minutes, more preferably less than 5, 2 or 1 minute. The masts are preferably operable between a first position when the masts are retracted as described herein for transportation of passengers on land and a second position in which the masts are raised and fully extended as described herein for transport on water.

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The sides preferably appear to have a brown wood grain appearance (and preferably texture) because of painting or composition of the sides. In one embodiment, the sides do not have this appearance or texture, but panels are optionally connected to the sides to provide the desired brown wood grain appearance and texture. The  
20 wood grain appearance generally comprises an appearance of a series of parallel wooden planks extending longitudinally along the sides of the vehicle as on a wooden ship.

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Preferably the vehicle is wheeled (4 wheels) and has retractable wheel covers, such as flaps that raise and lower over all or part of the exposed wheel sides. In the  
25 lowered position, the flaps cover all or part of the sides of the wheels and the flaps provide a brown wood grain appearance, similar to that on the sides of the vehicle. The appearance of flaps in the lowered position is intended to obscure the exterior wheel sides from view to provide an appearance of a substantially continuous tall ship or galleon hull. In the raised position, the flaps are stored at least partly away  
30 from the wheels. Retraction may be necessary to allow the wheels to turn. Typically at least two and preferably four flaps will be retracted when the vehicle is

operated on land. In one embodiment, the wheel covers are fixed and appear as part of the boat keel.

The invention optionally relates to a vehicle, such as an amphibious vehicle (eg. mass transit vehicle for land and water use) or a terrestrial vehicle comprising:

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a body; and

a retractable and extendible mast assembly connected to the body.

The vehicle typically has a bow at a fore end, and a stern at an aft end, a starboard side and a port side, and a keel.

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The vehicle and mast assembly optionally comprise mast extending and retracting means for extending and retracting a mast in the mast assembly. The mast extending and retracting means optionally folds the mast to retract the mast or optionally causes hollow portions of mast to retract, for example, nest, within each other in a retracted position. The vehicle and mast assembly optionally comprises a sail deployment and withdrawal means for deploying or withdrawing a sail. Either or both of these aforementioned means may optionally comprise systems, such as gears and pulleys for actuating the mast and/or sail and may be mechanically actuated or manually actuated. When extended, a mast tip may extend to a maximum height of at least: 30, 40, 50, 60 or 70 feet above ground level (ie. the location of the bottom of the wheels contacting a surface when the vehicle is on a level surface). When retracted, the masts are preferably retracted so that the mast tip (or other highest portion of the mast above the ground) is at a height of less than 15 or less than 14 feet above ground level. The sails optionally comprise a display area for displaying text and/or images, such as advertisements. The sails are optionally illuminated by an illumination means, such as light bulbs or fluorescent lights, for display at night. The vehicle of any one of claims 1 to 18, wherein the mast extends to a height above ground level selected from the group of at least: 30, 40, 50, 60 or 70 feet in the extended position and the mast retracts to a height above ground level selected from the group of less than: 20, 15, 14 or 13 feet in the retracted position (preferably at least 12 or 13 feet in the retracted position).

The sails optionally swivel around the mast. The yardarms also optionally swivel around the mast. The sails and yardarms and other vehicle components are optionally rotated between starboard and port for display purposes, for example, to generate the appearance of setting the sail for a desired tack.

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The vehicle optionally defines a longitudinal axis and a yardarm is parallel to the longitudinal axis in the retracted position and the yardarm is perpendicular to the axis of the vehicle in the extended position. The yardarm optionally comprises a shaft, having a longitudinal body wherein in the retracted position, the yardarm is stacked proximate and substantially parallel to other yardarms, whereas in the extended position, the yardarms are substantially parallel but moved apart to extend the sail.

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The retractable and extendable mast assembly optionally comprises a telescoping mast operable between a first position in which the retractable mast is retracted and a second position in which the retractable mast is extended and, optionally, the sails are deployed. The telescoping mast optionally comprises a plurality of hollow mast sections which are nested in a retracted first position and that extend by telescoping upward from the retracted first position to an extended position. The plurality of mast sections of the mast optionally comprise a lower mast section and an upper mast section, and optionally comprise a lower mast section, a middle mast section, and an upper mast section. . The retractable and extendable mast assembly optionally comprises a mast assembly, the mast assembly comprising a folding mast operable between a first position in which the retractable mast is folded and a second position when the retractable mast is extended, and, optionally, the sails are deployed. The folding mast optionally comprises a plurality of mast sections which are folded in a retracted first position and that extend by unfolding upward from the retracted first position to an extended position. The plurality of mast sections of the mast optionally comprise a lower mast section and an upper mast section and optionally comprise a lower mast section, a middle mast section, and an upper mast section. The vehicle optionally comprises a deck and a hull and the lower mast section is mounted to the deck and/or the hull. The vehicle optionally comprises a cord (eg, wire, rope or other material) and pulley system for extending and retracting the mast assembly. The vehicle optionally comprises a means for deploying the sail for display and retracting

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the sail for storage within a yardarm. The means for deploying optionally comprises a spring and flywheel assembly received in the yardarm or proximate to the yardarm for deploying the sail (eg. deploying for display such that wind can contact the sail) and withdrawing (retracting) the sail for storage, for example, within the yardarm or  
5 by storage in some other component of the mast assembly or a separate storage area (eg. container somehow restrained by attachment the vehicle).

The vehicle optionally comprises a source of pressurized fluid and a pressure line connecting the source of pressurized fluid and the mast for extending and retracting  
10 the mast. The vehicle optionally comprises a pressurized tank connected with the pressure line for supplying pressurized fluid to the mast. The source of pressurized fluid is optionally an engine-driven air compressor connected with the pressure line, for example, wherein the engine is the motive engine for the vehicle.

15 The mast system optionally further comprises a flexible pair of starboard fore and aft shrouds connected between each of a plurality of mast portions near the extended upper end of the mast.

The retractable and extendable mast assembly is optionally retracted to a retracted  
20 position where the vehicle travels on land without striking a telephone wire and without projecting into adjacent street lanes. Optionally, in the retracted position, the vehicle and mast are at a height less than the height of electricity and telephone wires suspended across streets. The height is optionally less than about 14 feet, preferably less than 13 feet, 8 inches or less than 13 feet. Optionally the beam is  
25 about 8 feet wide.

The vehicle optionally includes comprises rolling means for propelling the vehicle on land, wherein the rolling means comprises a plurality of wheels driven by an engine. The vehicle optionally comprises water displacement means for propelling the  
30 vehicle in water, wherein the water displacement means comprises an outboard or inboard motor, preferably a propeller, paddle wheel or jet drive propulsion system.

The vehicle of any one of claims 1 to 14, further comprising a seating deck for seating of passengers (the seating deck optionally including seats for at least: 6, 10, 20, 30 or 50 passengers). The deck is optionally connected to a side connected to a side, and/or the deck or hull

- 5 The vehicle body is water tight in amphibious vehicles and provides the vehicle with buoyancy in water.

- 10 The vehicle mast assembly is typically in a retracted position during vehicle movement on land. The vehicle mast assembly is typically extended and the sails are raised (deployed) during vehicle movement on water.

In an alternate embodiment, the mast may comprise a boom attached to the mast, for example, the lower section, the boom optionally having a sail slot for receiving the main sail.

- 15 The vehicle optionally further comprises a windshield in sides at the fore end of the vehicle. The vehicle optionally further comprises tail lights, turning signal lights and a rudder. The vehicle, when amphibious, optionally can launch from land into water from a standard boat launch (eg. metal, wood or beach).

- 20 Other features and advantages of the present invention will become apparent from the following detailed description. It should be understood, however, that the detailed description and the specific examples while indicating optional embodiments of the invention are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to  
25 those skilled in the art from this detailed description.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Embodiments of invention are described in relation to the drawings in which:

Figure 1 is a side view of the amphibious vehicle of the invention showing the masts in a raised/extended (first) position;

- 30 Figure 2 is a perspective view of the amphibious vehicle driving on land;

Figure 3 is a top view of the amphibious vehicle;

Figure 4 is a side view of a sailing vessel;

Figure 5 is a perspective view of an amphibious vessel showing telescoping masts in a retracted/lowered (second) position or partially lowered position; and

5 Figure 6 is a perspective view of the amphibious vehicle.

Figure 7 is a rear perspective view of the vehicle showing the vehicle with masts folded in a folded (retracted) position.

Figure 8 is a front perspective view of the vehicle showing the vehicle with masts folded in a folded (retracted) position.

10 Figure 9 is a front view of the vehicle showing the vehicle with masts extended in an extended position with sails deployed.

Figure 10 is a front perspective view showing the masts extended in an extended position with sails deployed.

15 Figure 11 is a front perspective view showing the masts extended in an extended position with sails not deployed.

Figure 12 is a front perspective view of the vehicle showing the vehicle with masts retracted in a retracted position. Optionally a plurality of hollow mast sections are nested in the retracted position.

20 Figure 13 is a rear perspective view of the vehicle showing the vehicle with masts extended in an extended position with sails deployed.

Figures 14a-d show a) rudder, b)-d) bow of the vehicle.

Figures 15a)-d) show masts extended and sails deployed in a) top view of vehicle, b) side perspective view of vehicle, c) rear view of vehicle and d) side view of vehicle.

25 Figure 16 shows a front perspective view of the vehicle with the masts extended in an extended position with sails deployed.



Figure 17 shows shows a front perspective view of the vehicle with the masts extended in an extended position with sails deployed.

Figure 18 is a front perspective view of the vehicle showing the vehicle with masts retracted in a retracted position. Optionally a plurality of hollow mast sections are  
5 nested in the retracted position. A plurality of yardarms are optionally oriented parallel to the longitudinal axis of the vehicle in the retracted position.

Figure 19 is a view of the steering wheel, deck, masts and seating area of the vehicle.

Figure 20 is a veiw of the outside of the vehicle body showing a rail, support  
10 members and wood-grain appearance.

Figure 21 shows a hinge mechanism with no simulated wood grain appearance.

Figure 22 shows a hinge mechanism with simulated wood grain appearance.

Figure 23a)-d) show hinge a) side view, b) perspective view, c) opposite side view, d) plan view.

15 Figure 24a)-d) shows a winch (eg. gear & pulley) a) plan view, b) perspective veiw, c) side veiw, d) plan view.

Figure 25a)-d) shows a winch (eg. gear & pulley) with cord (wire, rope etc.) a) plan view, b) perspective veiw, c) side veiw, d) plan view.

Figure 26a)-d) show a winch (eg. gear & pulley) with cord (wire, rope etc.) and  
20 manual override bar for manually turning the winch a) plan view, b) perspective veiw, c) side veiw, d) plan view.

### **Detailed Description of the Invention**

The invention relates to an amphibious passenger vehicle having masts and sides (left side, right side, back side) that appear similar to a tall ship sailing vessel or a  
25 galleon.

A "galleon" is a type of square rigged sailing ship. (exemplary definitions: A large three-masted sailing ship with a square rig and usually two or more decks, used from

the 15th to the 17th century especially by Spain as a merchant ship or warship. The American Heritage Dictionary of the English Language, Fourth Edition Houghton Mifflin Company; A sailing vessel of the 15th and following centuries, often having three or four decks, and used for war or commerce. Source: Webster's Revised  
 5 Unabridged Dictionary, MICRA, Inc.; a large square-rigged sailing ship with three or more masts; used by the Spanish for commerce and war from the 15th to 18th centuries; Source: WordNet 1.6, Princeton University. Rectangular sails are often used, although typically referred to as square sails.

"Tall ship" means "a sailing vessel with at least two masts, especially a square-rigger. Again, rectangular sails are often used, although typically referred to as  
 10 square sails. (Merriam-Webster's Collegiate Dictionary). More information on tall ships is found at <http://www.tallship.co.uk/>. A tall ship is optionally a schooner, with more triangular sails. A tall ship does not have to be old or historic in its appearance or actual age.

15 Exemplary description and drawings of galleons and tall ships may be found in the following publications: Thad Koza. Tall Ships: The Fleet for the 21st Century (Publisher: Tidemark Pr Ltd; 3rd edition (September 2002)); Dean Server, John Burdick. Tall Ships: The Magic of Sail Todtri Productions Ltd; (December 1999); John F. Guilmartin, Jr. Guilmartin, John Francis Guilmartin. Galleons and Galleys  
 20 (Sterling Publications; (March 2002)); Veres Laszlo, Richard Woodman. The Story of Sail: Illustrated With 1000 Scale Drawings (United States Naval Inst.; (December 1999)); Robert Forrest Burgess, Carl J. Clausen. Gold, Galleons, and Archaeology: A History of the 1715 Spanish Plate Fleet and the True Story of the Great Florida Treasure Find (Bobbs-Merrill Co; (January 1977)); Stephen Howarth, Joseph  
 25 Wheatley. Historic Sail: The Glory of the Sailing Ship from the 13th to the 19th Century (Greenhill Books/Lionel Leventhal; (April 2000)).)

The portion of the sides that appears similar may be all or part of the hull or panels over the hull. The sides may appear similar to a tall ship or galleon because of the type of material used or decoration on the material (Fig. 1). For example, the hull is  
 30 optionally painted to resemble woodgrain boards. In another embodiment, the hull is covered in a shell or paneling constructed out of fibre glass and resin or plastic which is painted and textured to resemble woodgrain boards and affixed to the hull. Masts

are embedded into the deck of the vehicle (the vehicle may have more than one deck, such as 2, 3 or 4 decks). In one embodiment, four masts are used, with three of the masts protruding vertically from the main deck of the vehicle and the fourth mast protruding at an angle, for example between 0 and 15 degrees from the tip of the bow end of the vehicle. The masts are optionally constructed out of lightweight aluminium, plastic or plastic/fibre composite materials. The masts are optionally of fixed length. In such as case, the masts are configured in length to fit under telephone and power wires. As well, the sails and supports for the sails (sail supports are transverse or perpendicular to a vertical mast) may be retracted or configured to not protrude into the oncoming lane of traffic, road shoulder or sidewalks when the vehicle is in operation on land. The masts optionally have the ability to be retracted or extended to their full length in a similar fashion to a telescoping radio antenna as required to enable proper vertical clearances as the vehicle is operated on roadways. The extended height of the tip of the mast may be at least about 30, 40, 50, 60 or 70 feet above ground. Preferably the masts are retracted to 14 feet above ground or less. The front mast (lance) also retracts, preferably telescopically) to reduce the length of the vessel. Examples of retractable (telescoping) masts are shown in US patent nos. 6,526,901 and 4,657,514. The mast optionally folds in one, two or more places to reduce its height. In the configuration where retractable masts are utilized, the masts are optionally extended or retracted through the use of either electric motors, hydraulics, compressed liquids or gases or manually via crank or ropes/wires. In both configurations, the masts are rigged with pulleys, ropes and fabric to resemble the sails of a tall ship. There is often more than one sail on a mast. Rigging is optionally pulled up into a retractable spring loaded pulley. Preferably the cross members on the mast are lowered with the mast and, if there are a plurality of such cross members on a single mast, they stack one on top of the other. In the retracted position, the ship is optionally 8.5 feet wide or less, 14 feet high or less and 45 feet long or less.

Referring to Fig. 5, there is depicted the retractable mast in its fully retracted position wherein lower mast section houses the middle (center) mast section and the upper mast section and is surrounded at its lower end by a base. The base may be on, in or below the deck. The mast base is optionally directly attached to the keel or hull,

for example, by mast base fasteners. If attached to the keel, the fasteners may extend through the boat hull.

5 In a retracted position, lower mast section, central mast section, and upper mast section are concentrically nested.

10 In one embodiment, the sections (eg. lower, middle and upper sections) are configured to allow the structure to collapse and nest within itself. The mechanism is optionally a wire (or rope or other suitable material) and gear pulley system contained within each mast. Alternates to gears are also readily apparent. The gears are operated to pull the wires and raise the mast sections. When it is desired to retract the mast the wires and pulleys are actuated to allow the upper mast section and middle mast section to collapse, for example, by force of gravity into the lower mast section (optionally, all three sections may be lowered). The system is optionally  
15 operated electronically and manually.

The middle mast section, lower mast section and upper section optionally each feature an upper stop and a lower stop mounted internally near each of their upper end and lower ends, respectively, as well as end walls. The mast optionally rests on  
20 the base attached by fasteners to deck of the vehicle.

In an alternate embodiment, the retractable mast is erected, for example, by supplying air or hydraulic fluid under pressure through pneumatic lines and valves, forcing middle mast section and upper mast section to telescope upward, for  
25 example, by pressing on their respective lower end walls. Air or other pressurized gas, such as hydraulic fluid, is useful. Compressed air may be provided to mast through pressure air lines and a regulator connected to an air compressor driven by the boat motor. In one embodiment, middle mast section is retained by lower stop when it reaches a lower mast section stop. The upper mast section is optionally  
30 retained by a lower stop when it reaches a middle mast section upper stop. The upper mast section optionally includes an upper section airtight seal which interacts with the inner surface of the middle mast section to form an airtight seal for the middle chamber. The middle mast section optionally features a middle section airtight seal which interacts with the inner surface of the lower mast section to form

an airtight seal for the lower chamber. When it is desired to retract the mast, air or hydraulic fluid is released through valves, allowing the upper mast section and middle mast section to collapse, for example, by force of gravity into the lower mast section. One or both of the respective middle chamber lower wall and the upper  
5 chamber lower wall may be omitted as desired, leaving the entire interior of the retractable mast open.

In an alternate embodiment, the mast is lowered by folding. For example, an upper section of the mast may fold down so that it is substantially perpendicular to a lower  
10 section. Alternatively, an upper section and a middle section may both fold down to be substantially perpendicular to a lower section. Other angles of folding will be useful, for example, to reduce the height of the vehicle to allow the vehicle to pass under power lines when traveling on land.

15 Mast embodiments may include 2, 3, or more sections. The mast sections may be any useful shape, such as circular, elliptical, or other configuration as desired and may be constructed of aluminum or other metal or synthetic material. The masts are preferably tubular.

20 The retractable mast vehicle optionally has rigging features. For example, one optionally attaches shrouds, for example, to opposite sides of the mast which give lateral support to the masts or which merely serve an ornamental function without providing support. Stays are also optionally attached to the mast. Stays and shrouds are typically made of flexible material such as wire or rope so as to  
25 conveniently lay on the deck when the mast is in a retracted position. One or more halyard pulleys are optionally attached to the top of the mast.

A boom bracket is optionally located at a convenient distance above deck to opposing sides of the mast lower section. A boom bracket swivel optionally rotatably  
30 attaches the boom with the boom bracket. The lower edge of a sail is optionally attached to the boom by a sail slot formed along the upper length of the boom. The sail may alternatively be fully supported by the retractable mast by means of hoops, zippers, slots, etc. as may be convenient. In variations, the sail is retractable into the

boom or mast or other portions of the ship, for example, readily adapted from the the technical aspects as described below with respect to the seven sail embodiment.

Coventional mechanisms may also be used to attach a sail. In an alternate  
5 embodiment, once the mast is extended, the sail is optionally attached and raised by pulling on the sail to raise it.

Preferably the vehicle is wheeled (eg. 4 wheels) and has retractable wheel covers, such as flaps that raise and lower over all or part of the exposed wheel sides (Fig. 1-  
10 3). In the lowered position, the flaps cover all or part of the sides of the wheels and the flaps optionally provide a brown wood grain appearance, similar to that on the sides of the vehicle. The appearance of flaps in the lowered position is intended to obscure the exterior wheel sides from view to provide an appearance of a substantially continuous tall ship or galleon hull. In the raised position, the flaps are  
15 stored at least partly away from the wheels. Retraction may be necessary to allow the wheels to turn on land. Typically at least two and preferably four flaps will be retracted when the vehicle is operated on land. In one embodiment, the wheels of the vehicle are optionally covered by flaps which are constructed of similar materials as that of the hull and painted or covered in a similar fashion to the hull to provide  
20 the appearance of the bottom on keel of a tall ship sailing vessel. Preferably, the wheel cover flaps descend or open out from the bottom of the hull above the placements for the wheels on each side of the vehicle immediately prior to entering water. Using the combination of the hull paint/cladding, masts, rising and lowering wheel cover flaps, the amphibious vehicle is convertible into a scale replica of a  
25 Spanish Galleon or other type of tall ship sailing vessel which is capable of travelling through water.

Most masted ships, such as recreational sailboats, have removable masts because the masts can be removed for transport or storage of the boat on land. In such situations, the mast may be completely separated from the boat. However, a  
30 retractable mast in the sense of this invention means that when the vehicle is in operation the mast may be raised and lowered in less than 10 minutes, or less than 5 minutes, preferably in less than two minutes or one minute and remains in contact with the boat in order to ensure passenger safety. The masts may be raised and

lowered without the use of equipment, such as hoists or cranes that are mounted on land, apart from the boat. As well, the sails typically do not need to be removed before or after retracting the masts. The sail optionally automatically raises and lowers with the mast.

- 5 The vehicle may also include a rudder on the back side of the boat. (The rudder may be ornamental in that it is not used for steering and is provided in addition to any rudder components used to steer the ship). The rudder may be retractable onto the deck or into the back side of the ship, for example, when the vehicle is operated on land. Canons may also be fixed to the deck or sides or releasably mounted on the  
10 deck or sides to be obscured from view when on land, but exposed for view when the vessel is in water.

#### *Seven Sail Vehicle*

- It will be readily apparent that vehicle aspects described with respect to the seven sail vehicle embodiment are readily applied to the other vehicle embodiments  
15 described in this application. As well, the seven sail vehicle design described below is readily modified to incorporate various vehicle features described in this application.

- In one embodiment, the vehicle is equipped with 7 sails. The vehicle is optionally amphibious for travel in land and water or terrestrial for use on land only. The  
20 vehicle is preferably designed for both land and water operations in accordance with national and international marine and highway regulation.

- The vehicle provides the function of mass transit of tourists by carrying up to, for example, 60 passengers who take part in land and water based tours. The terrestrial vehicle is similarly useful for mass transit of tourists. The vehicle also optionally  
25 provides the second function of marketing and promotion by displaying advertising on its sails.

- Preferably, the sails are made from a lightweight polyurethane material, or other suitable sail material, micro-perforated for reducing wind resistance and the fabric is preferably fade and micro-biological resistant. Typically, the sails are not functional  
30 for moving the boat forward, but are primarily ornamental (visually appealing) and

also provides a display area for advertisements (for example, by company lease of a display area).

The vehicle includes a mast system. Each mast is optionally constructed of lightweight industrial marine grade aluminum. A mast is preferably divided into at least 3 tiers (eg. lower, middle and upper tiers) allowing the structure to collapse and nest within itself. The mechanism is optionally a wire and gear pulley system contained within each mast. The system is optionally operated electronically and manually. The winch system is optionally designed as positive up and positive down meaning that tension on the mast whether extending to full height or retracting is always under positive control by the lower winch assembly. Each section of the mast optionally has one eyelet and pulley. The eyelet is used to secure the cable for the mast above and the pulley is used to assist in the lowering and raising of each segment.

The first yardarm is optionally a lower yardarm constructed of lightweight industrial marine grade aluminum. The lower yardarm optionally houses the main sail for each mast, and is governed by a spring and flywheel assembly. This mechanism allows for rapid and easy deployment and retraction of the sails.

The second yardarm contains a mechanism similar to the lower yard arm. In addition to the system there are optionally a series of clamps/hooks to attach the underside of the yardarm. These hooks are used to manually attach the sail housed in the arm below it.

The third yardarm optionally has no mechanism except for the clamp/hook assembly.

The vehicle optionally includes a yardarm hinge and clamping system. The vehicle optionally includes a removable yardarm assembly which is particularly useful for marketing purposes. Companies can actually own or lease yardarm(s) for marketing and advertising. A second useful feature of this system is ease of maintenance and replacement.

There are optionally three positions involved in raising and lowering the mast. One position is a transit lowered position which is useful for terrestrial transit (e.g. highway and city transit). The mast and yardarms are typically lowered and in a



collapsed position and locked in place. The yardarms are typically locked and pointing forward and aft.

5 In another position, the transit clearance position, the mast and sails are extending to full height and the sails and yardarms are optionally rotated to an angle off the starboard bow, such as a 30 degree angle, for building, pedestrian and road traffic clearance. Any other angle that permits for building, pedestrian and road traffic clearance would also be useful.

10 Another position is the full position, in which the full sail is used. The mast sails and yardarms are fully extended and locked into position, for example, at 90 degrees of the hull centre line. This position is useful for water transit. It is also useful when the vehicle is parked on land in a location where there is clearance to deploy the full sail.

15 The vehicle optionally includes navigational lights, such as, a masthead light, a stern light, a port running light, a starboard running light, highway and road lighting, headlights, flashers, side running lights 4 per side and signal lights. The vehicle also optionally includes safety equipment such as first aid kits, personal flotation devices (for example, with a vehicle capable of carrying up to 60 passengers, 64 devices may be provided) and a flare kit.

20 While the present invention has been described with reference to what are presently considered to be the preferred examples, it is to be understood that the invention is not limited to the disclosed examples. To the contrary, the invention is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

25 All publications, patents and patent applications including the US provisional application no. 60/501,018, "Masted Amphibious Vehicle" (Roberts) filed on September 9, 2003, are herein incorporated by reference in their entirety to the same extent as if each individual publication, patent or patent application was specifically and individually indicated to be incorporated by reference in its entirety.